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TP Modul 13

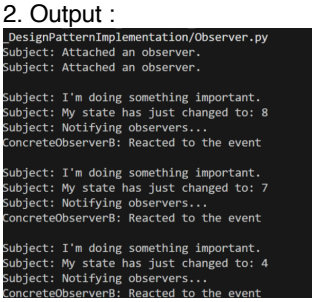
A. Contoh Penggunaan:
Observer pattern cocok digunakan dalam aplikasi cuaca, di mana terdapat objek pusat (misalnya WeatherStation) yang memantau kondisi cuaca, dan berbagai objek lain seperti aplikasi mobile, layar digital, atau sistem peringatan cuaca (subscribers) ingin mendapatkan pembaruan setiap kali data cuaca berubah.
B. Langkah-langkah Implementasi:
1. Tentukan objek publisher (subjek yang diamati) yang menyediakan metode untuk subscribe, unsubscribe, dan notify.
2. 3. 4. Buat antarmuka (interface) untuk subscriber dengan metode update(). Objek-objek yang ingin berlangganan perubahan akan mengimplementasikan antarmuka tersebut.
Saat terjadi perubahan pada publisher, ia akan memanggil update() pada semua subscriber yang terdaftar.
C. Kelebihan dan Kekurangan:
Kelebihan:
• Mendukung prinsip Open/Closed: objek baru dapat ditambahkan tanpa mengubah kode yang sudah ada.
• Relasi antar objek bisa dibentuk secara dinamis saat runtime.
Kekurangan:
• Urutan notifikasi tidak terjamin (acak).
• Jika terlalu banyak subscriber, performa bisa menurun karena banyaknya notifikasi yang harus dikirim.1. Source Kode :

```
from __future__ import annotations
from abc import ABC, abstractmethod
from random import randrange
from typing import List
class Subject(ABC):
"""
"""
The Subject interface declares a set of methods for managing subscribers.
@abstractmethod
def attach(self, observer: Observer) -> None:
"""
Attach an observer to the subject.
"""
pass
@abstractmethod
def detach(self, observer: Observer) -> None:
"""
Detach an observer from the subject.
"""
pass
@abstractmethod
def notify(self) -> None:
"""
Notify all observers about an event.
"""
pass
class ConcreteSubject(Subject):
"""
state
changes.
"""
The Subject owns some important state and notifies observers when the
```

```
_state: int = None"""
For the sake of simplicity, the Subject's state, essential to all
subscribers, is stored in this variable.
"""
_observers: List[Observer] = []
"""
List of subscribers. In real life, the list of subscribers can be stored
more comprehensively (categorized by event type, etc.).
"""
def attach(self, observer: Observer) -> None:
print("Subject: Attached an observer.")
self._observers.append(observer)
def detach(self, observer: Observer) -> None:
self._observers.remove(observer)
The subscription management methods.
"""
"""
def notify(self) -> None:
"""
Trigger an update in each subscriber.
"""
print("Subject: Notifying observers...")
for observer in self._observers:
observer.update(self)
def some_business_logic(self) -> None:
"""
Usually, the subscription logic is only a fraction of what a Subject can
really do. Subjects commonly hold some important business logic, that
triggers a notification method whenever something important is about to
happen (or after it).
"""
print("\nSubject: I'm doing something important.")
self._state = randrange(0, 10)print(f"Subject: My state has just changed to: {self._state}")
self.notify()
class Observer(ABC):
"""
"""
The Observer interface declares the update method, used by subjects.
@abstractmethod
def update(self, subject: Subject) -> None:
"""
Receive update from subject.
"""
pass
"""
Concrete Observers react to the updates issued by the Subject they had been
attached to.
"""
class ConcreteObserverA(Observer):
def update(self, subject: Subject) -> None:
if subject._state < 3:
print("ConcreteObserverA: Reacted to the event")
class ConcreteObserverB(Observer):
def update(self, subject: Subject) -> None:
if subject._state == 0 or subject._state >= 2:
print("ConcreteObserverB: Reacted to the event")
if __name__ == "__main__":
# The client code.
subject = ConcreteSubject()
```

observer_a = ConcreteObserverA()
subject.attach(observer_a)
observer_b = ConcreteObserverB()
subject.attach(observer_b)subject.some_business_logic()
subject.some_business_logic()
subject.detach(observer_a)
subject.some_business_logic()

2. Output :



3. Penjelasan :
Jadi, di main ada objek subject dan dua observer, lalu mendaftarkan observer ke subject, menjalankan aksi yang mengubah state subject dan mengirimkan update ke observer, kemudian melepas satu observer dan menjalankan aksi lagi untuk melihat bahwa hanya observer yang tersisa yang mendapatkan notifikasi. Ini menggambarkan mekanisme dinamis subscribe dan unsubscribe pada Observer pattern.